

ABSTRACT OF THE DISCLOSURE

A membrane-based process for separating mixtures of target gases if the gas mixture also contains C_{3+} hydrocarbon vapors. The process uses gas-separation membranes having a base membrane and a coating layer. The base membrane incorporates a selective layer made from a polymer selective between the light gases to be separated. The coating layer comprises a fluorinated polymer capable of protecting the base membrane from C_{3+} hydrocarbon vapors and liquids.